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TRACK 2: FORMAL EDUCATION: CYBERSECURITY COMPETITIONS IN THE HEALTHCARE ENVIRONMENT

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Agenda

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- Introduction
- Project Background
- Current Cybersecurity Competitions
- Women as White-Collar Criminals
- Why Healthcare?
- Student Involvement
- Project Timeline
- Conclusion

Introduction

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- Observation: the cybersecurity field is predominantly male
 - Why?
- Cybersecurity competitions are male-focused
 - “Attack”/ “Defend” nature
 - Attendance by females is poor
- Broad questions:
 - Can we create a more female-friendly focus for cybersecurity competitions and so attract more women into the field?
 - Is healthcare a good platform for attracting women into cybersecurity?

Cyber-Security Competitions

Sample

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Competition	Sponsors	Gender Focus
CyberPatriot	The Air Force Association	Male
National Collegiate Cyber Defense Competition (NCCDC)	Defense companies and other organizations	Male
CyberQuests	The CyberAces foundation	Male
CyberGuardian and NetWars	The SANS Institute	Male
DC3 Digital Forensics Challenge	The DoD Cyber Crime Center	Male
Panoply Network Security Competition	University of Texas	Male
?	?	Female

Background/Literature Review

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- Known fact: a notable participation gap by women, underrepresented minorities, and persons with disabilities in science and technology (NSF, 2011)
- A call for an ACM Special Interest Group to broaden participation in computing as an international issue (Dahlberg, 2012)
- Women are not entering the cybersecurity specialty in large numbers (BagshiSen, Rao, and Upadhyaya, 2010)

Literature Review, Cont'd

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- Possible strategies for attracting women to the cybersecurity field (Woszezynski & Shade, 2010):
 - Better recruiting and retention strategies
 - Development of mentors
 - Changes in presentation of the field
- Competitions can help students push themselves harder and achieve higher levels of learning (Burguillo, 2010)
- Environmental factors have a positive impact on females in considering education and careers in the cybersecurity field
 - NSF has supported a number of programs in this area (Dampler, Kimberly & Carr, 2012)

Women Committing Crimes

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- Sociologists have studied female roles in corporate crimes (Steffensmeier, Schwartz, and Roche, 2013)
- Found that typically women were not part of conspiracy groups
- White-collar crimes by women were largely based on “relationships” with others or “utility” (e.g., to pay bills)
- Determined that women are socialized “to an ethic of care” and crimes reflect this
- Means they are less likely to engage in behaviors that hurt others

Women as Hackers

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- One female out of seven hackers identified as part of Anonymous
- Mercedes Haefer, also known by "No"
- Part of 'Paypal 14,' a group of hackers arrested by the FBI in 2011 for allegedly participating in a cyberattack against PayPal
- Stated to “avenge the cancellation of Wikileaks Facebook page”
- Previously a journalism and media studies major at UNLV
- Betsy Isaacson, The Huffington Post, 6/7/2013



Why Health Care?

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- Major concern for data breaches
- Symantec Intelligence Report, May 2013 lists healthcare sector as the business sector with the most number of data breaches
 - 43% health care
 - 15% education
 - 9% retail
- Pomenon Institute 2013 Cost of Data Breach Study: United States shows that healthcare has the second highest per capita cost: \$305
 - Heavily regulated industries have higher costs in general
 - Number one is transportation
- IT important to improving cost and availability of healthcare for everyone

A Healthcare Cybersecurity Competition?

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- Appeal to “to ethic of care” prevalent in female students
- Highlight cybersecurity issues as healthcare moves to digital records
- Use “protect” and “abuse” scenarios to ensure female interest is aroused by potential damages of security breaches
- Build upon existing competition platforms to jump start competition
- Look to healthcare industry for support

Rationales

- Self-efficacy is an important determinant in selecting a college major or career (Betz, 2000)
- Success may encourage emotional attachment to the activities and start an engagement with the profession (Prenzel, 1992)
- Activities have been shown to improve student interest and develop their skills for the real world (Dede, 2009)

Project Setting

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- Small liberal arts college with a diverse student population of approximately 3,700 undergraduate and graduate students
 - Undergraduates: 70% female, 16% African American, 15% Hispanic, and 8% Asian/Pacific Islander
- The recent award of a CyberCorp Scholarship for Service (SFS) grant and the NSA/DHS CAE/IAE designation
- IT/Cybersecurity, Health Information Management, and Health Care Management programs co-located in the same school

Purpose of the Project

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- To develop a type of cybersecurity competition to attracts middle/high school female students into the field of cybersecurity
 - ▣ Using "real world health care" problems
 - ▣ Use college students to develop competition basics
 - ▣ Focusing on the security and privacy of documents instead of network security
- To change the presentation of cybersecurity
 - ▣ Moving away from the "attack" and "defend" terminology of male-dominated cybersecurity competitions
 - ▣ Moving to "protect" and "use" scenarios in health care field that is meaningful to girls

Project Objectives

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- Engage college students in developing a cyber-security competition for middle/high school students using a healthcare technology scenario
- Organize and run a pilot competition within the framework of a summer camp
- Establish curriculum materials for middle/high school cybersecurity teachers and cybersecurity club advisors
- Obtain sponsorship for the competition
- Encourage other institutions to create similar female-friendly cyber-security competitions

Designed by Students for Students

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- Undergraduate and graduate students will be actively engaged in a variety of activities
 - ▣ Developing the competition scenarios
 - ▣ Building the hardware, software and data environment
 - ▣ Creating the materials for the summer camp
 - ▣ Participating in the competitions themselves as “mentors”
- Graduate students in Health Care Management/ Information Technology dual degree will provide the healthcare scenario
- Students in undergraduate courses will develop infrastructure:
 - ▣ Computer Networking
 - ▣ Electronic Document Management
 - ▣ Corporate Security

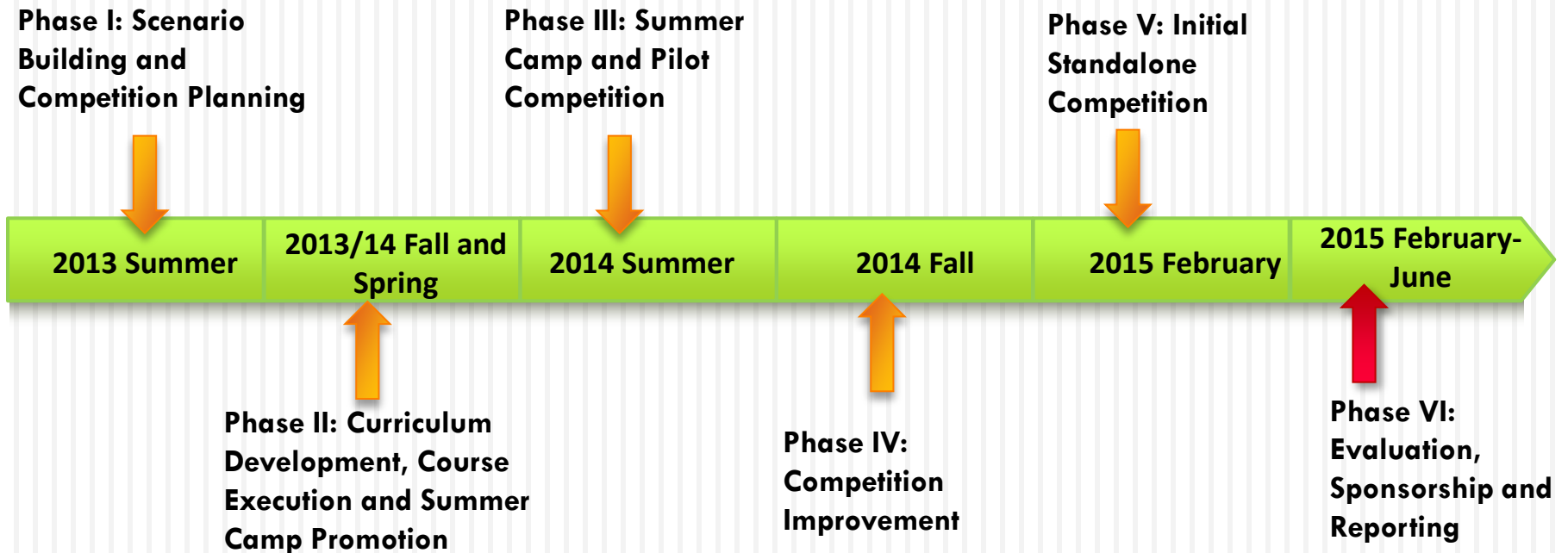
Recruiting Female Students

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- Use existing female-oriented groups as role models
 - Women's Society of Cyberjutsu
- Use existing computer-oriented organizations
 - Computer Science Teachers Association
- Use college students to talk to middle school and high schools students
 - Excitement over their involvement in developing the competition
 - Connect with younger group

PROJECT TIMELINES

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Contribution to Field

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- Use students in interdisciplinary project to develop competition
- Extend cyber-security competitions' focus to attract middle/high school female students and potentially drawing them to a career in cybersecurity
 - Move away from the current emphasis of "attack" and "defend" scenarios to one of more "use", "misuse" and "abuse" of systems and their protection
 - Unique context: the increasingly important healthcare field
- Can be replicated across the nation by similar small- to mid-size colleges and institutions and be sponsored by the healthcare community
- Model can also be replicated in industry segments other than healthcare based on the profile of the university



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Thank You !

Questions?

